311-CD-626-001

EOSDIS Core System Project

Release 6B
Subscription Server Database Design and Schema Specifications for the ECS Project

September 2002

Raytheon Company
Upper Marlboro, Maryland

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Prepared Under Contract NAS5-60000
CDRL Item #050

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Preface

This document describes the data design and database specification for the Subscription Server subsystem. It is one of eleven documents comprising the detailed database design specifications for each of the ECS subsystems.

The subsystem database design specifications for the as delivered system include:

311-CD-620-001	Release 6B Data Management (DM) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-621-001	Release 6B Ingest Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-622-001	Release 6B Interoperability Subsystem (IOS) Database Design and Database Schema Specifications for the ECS Project
311-CD-623-001	Release 6B Planning and Data Processing Subsystem (PDPS) Database Design and Database Schema Specifications for the ECS Project
311-CD-624-001	Release 6B Science Data Server (SDSRV) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-625-001	Release 6B Storage Management (STMGMT) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-626-001	Release 6B Subscription Server (SUBSRV) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-627-001	Release 6B Management Support Subsystem (MSS) Database Design and Database Schema Specifications for the ECS Project
311-CD-628-001	Release 6B Configuration Registry Subsystem (CONFIG) Database Design and Database Schema Specifications for the ECS Project
311-CD-630-001	Release 6B PDS Subsystem Database Design and Database Schema Specification
311-CD-631-001	Release 6B Name Server Subsystem Database Design and Database Schema Specification

This document is a contract deliverable with an approval code 2. As such, it does not require formal Government acceptance. Contractor approved changes to this document are handled in accordance with change control requirements described in the EOS Configuration Management Plan. Changes to this document will be made by document change notice (DCN) or by complete revision.

Entity Relationship Diagrams (ERDs) presented in this document have been exported directly from tools and some cases contain too much detail to be easily readable within hard copy page constraints. The reader is encouraged to view these drawings on-line using the Portable Document Format (PDF) electronic copy available via the ECS Data Handling System (ECS) on the world wide web at http://edhs1.gsfc.nasa.gov.

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Abstract

This document outlines Release 6B “as-built” database design and database schema of the Subscription Server database including the physical layout of the database and initial installation parameters.

Keywords: data, database, design, configuration, database installation, scripts, security, data model, data dictionary, replication, performance tuning, SQL server, database security, replication, database scripts

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Abbreviations and Acronyms

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1. Introduction

1.1 Identification

This Subscription Server (SUBSRV) Database Design and Database Schema Specification document, Contract Data Requirement List (CDRL) Item Number 050, whose requirements are specified in Data Item Description DID 311/DV2, is a required deliverable under the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS), Contract NAS5-60000.

1.2 Scope

The SUBSRV Database Design and Database Schema Specification document describes the data design and database specifications to support the data requirements of Release 6B SUBSRV software.

1.3 Purpose

The purpose of the SUBSRV Database Design and Database Schema Specification document is to support the maintenance of SUBSRV data and databases throughout the life cycle of ECS. This document communicates the database implementation in sufficient detail to support ongoing configuration management.

1.4 Audience

This document is intended to be used by ECS maintenance and operations staff. The document is organized as follows:

Section 1 provides information regarding the identification, scope, purpose and audience of this document.

Section 2 provides a listing of the related documents, which were used as a source of information for this document.

Section 3 contains the database overview for the SUBSRV physical data model which are the database tables, triggers, stored procedures, and flat files.

Section 4 provides a description of database performance and tuning features such as indexes, caches, and segments.

Section 5 provides a description of the database security infrastructure used for the approach, and a list of the users, groups, roles, and Login/group permissions available upon initial installation.

Section 6 provides a description of scripts used for the installation, de-installation, backup/recovery, and miscellaneous.

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2. Related Documents

2.1 Applicable Documents

The following documents, including Internet links, are referenced in the SUBSRV Database Design and Database Schema Specification, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this volume. Internet links cannot be guaranteed for accuracy or currency.

920-TDG-009	GSFC Release B0 DAAC Database Information
920-TDN-009	NSIDC Release B0 DAAC Database Information
920-TDE-009	EDC Release B0 DAAC Database Information
920-TDL-009	LARC Release B0 DAAC Database Information
920-TDS-009	SMC Release B0 DAAC Database Information
920-TDM-009	Mini-DAAC Release B0 Database Information
920-TDG-001	GSFC Version 2.0 Hardware Diagram
920-TDN-001	NSIDC Version 2.0 Hardware Diagram
920-TDE-001	EDCC Version 2.0 Hardware Diagram
920-TDL-001	LARC Version 2.0 Hardware Diagram
920-TDS-001	SMC Version 2.0 Hardware Diagram
920-TDM-001	Mini-DAAC Version 2.0 Hardware Diagram
920-TDG-002	GSFC Version 2.0 Hardware Software Mapping
920-TDN-002	NSIDC Version 2.0 Hardware Software Mapping
920-TDE-002	EDC Version 2.0 Hardware Software Mapping
920-TDL-002	LARC Version 2.0 Hardware Software Mapping
920-TDS-002	SMC Version 2.0 Hardware Software Mapping
920-TDM-002	Mini-DAAC Version 2.0 Hardware Software Mapping

2.2 Information Documents

The following documents, although not directly applicable, amplify or clarify the information presented in this document. These documents are not binding on this document.

311-CD-620-002	Data Management (DM) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-621-002	Ingest Subsystem (INS) Database Design and Database Schema Specifications for the ECS Project
311-CD-622-002	Interoperability Subsystem (IOS) Database Design and Database Schema Specifications for the ECS Project
311-CD-623-002	Planning and Data Processing Subsystem (PDPS) Database Design and Database Schema Specifications for the ECS Project
311-CD-624-002	Science Data Server (SDSRV) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-625-002	Storage Management (STMGT) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-626-002	Subscription Server (SUBSRV) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-627-002	Management Support Subsystem (MSS) Database Design and Database Schema Specifications for the ECS Project
311-CD-628-002	Configuration Registry Subsystem (CONFIG) Database Design and Database Schema Specifications for the ECS Project
311-CD-630-001	PDS Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-631-001	Name Server Subsystem (NM) Database Design and Database Schema Specifications for the ECS Project

3. Data Design

3.1 Database Overview

Data requirements for SUBSRV span two logical grouping areas:

Event information – data pertaining to defined events

Subscription information – data pertaining to subscriptions

Database versioning information

The SUBSRV database implements the large majority of the persistent data requirements for the SUBSRV subsystem. The database is designed in such a manner as to satisfy business policy while maintaining data integrity and consistency. Database tables are implemented using the Sybase Relational Database Management system (RDBMS). All components of the SUBSRV database are described in the sections, which follow.

3.1.1 Physical Data Model Entity Relationship Diagram

Figure 3-1, the Entity Relationship Diagram (ERD), presents a schematic depiction of the SUBSRV physical data model. The ERDs presented here for the SUBSRV database were produced using the Power Designer Data Architect Computer Aided Software Engineering (CASE) tool. ERDs represent the relationship between entities or database tables. The key for the symbols used in the ERDs follows.

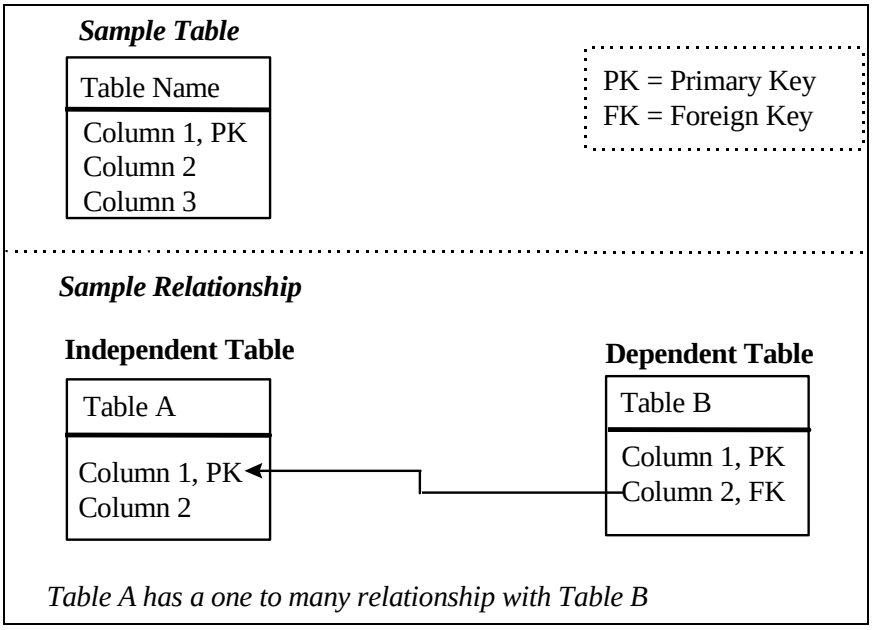

Figure 3-1. ERD Key

The ERDs for the SUBSRV database are shown in Appendix A.

3.1.2 Tables

A listing of each of the tables in the SUBSRV database is given in table 3-1. A brief definition of each of these tables follows.

Table 3-1. SUBSRV Database Tables Listing

Table Name	Logical Grouping
EcDbDatabaseVersions	Database versioning
EcSbActionWorkOff	Subscription Information
EcSbEvent	Event Information
EcSbNewEventID	Event Information
EcSbNewSubID	Subscription Information
EcSbSubscription	Subscription Information
EcSbSubWorkoff	Subscription Information
EcSbTriggerRequest	Event Information

Table 3-2 identifies the current version level of the SUBSRV database.

Table 3-2. EcDbDatabaseVersions

Name	Type	PK	Mandatory
EcDbSchemaVersionID	Smallint	Yes	Yes
EcDbComments	Varchar(255)	No	No
EcDbCurrentVersionFlag	Char(1)	No	No
EcDbDatabaseName	Varchar(255)	No	No
EcDbDropDescription	Varchar(255)	No	No
EcDbDropInstallDate	Datetime	No	No
EcDbDropVersion	Char(64)	Yes	Yes
EcDbSybaseServer	Varchar(255)	No	No
EcDbSybaseVersion	Varchar(255)	No	No
EcDbUpdateProcess	Varchar(255)	No	No

Table 3-3 is used to store actions whose qualifiers of associated subscriptions match the actuals of the event being triggered. It also stores the status of these actions. These subscriptions' actions will be processed and the entry removed in the table upon completion.

Table 3-3. EcSbActionWorkOff

Column	Type	PK	Mandatory
ActionID	Numeric (8,0)	No	Yes
ActionStatus	Varchar(6)	No	No
OutBound RpcID	Varchar(250)	No	No
RpcID	Varchar(250)	No	Yes
SubID	Int	No	Yes
TimeReceived	Datetime	No	Yes
Tries	Int	No	No

Table 3-4 contains the list of events to which a user, or another subsystem can subscribe.

Table 3-4. EcSbEvent

Column	Type	PK	Mandatory
Category	varchar(35)	No	Yes
EventID	int	Yes	Yes
Object	text	No	Yes
UserID	varchar(12)	No	Yes

Table 3-5 is used to generate the next available ID for the EcSbEvent table.

Table 3-5. EcSbNewEventID

Column	Type	PK	Mandatory
ID	Int	No	No

Table 3-6 is used to generate the next available ID for the EcSbSubscription table.

Table 3-6. EcSbNewSubID

Column	Type	PK	Mandatory
ID	int	No	No

Table 3-7 lists all the user and subsystem subscriptions. Each event can have many subscriptions. Each user can have many subscriptions. The same user can subscribe to the same event with different constraints. It is also possible that a user could subscribe to the same event with the same constraints.

Table 3-7. EcSbSubscription

Column	Type	PK	Mandatory
subID	int	Yes	Yes
eventID	int	No	Yes
expDate	datetime	No	Yes
object	text	No	Yes
userID	varchar(30)	No	Yes

Table 3-8 is used to store temporary data of subscriptions to the event triggered by the request represented by the RpcID. The SubID is retrieved from the EcSbSubscription table.

Table 3-8. EcSbSubWorkOff

Column	Type	PK	Mandatory
RpcID	Char(250)	No	Yes
SubID	Int	No	Yes
TimeReceived	Datetime	No	No

Table 3-9 is used to store trigger requests received from Event producer until it's processing is completed.

Table 3-9. EcSbTriggerRequest

Column	Type	PK	Mandatory
RpcID	Varchar(250)	Yes	Yes
Actual	Text	No	Yes
EventID	Int	No	No
EventStatus	Varchar(6)	No	No
TimeReceived	Datetime	No	No

3.1.3 Columns

Brief definitions of each of the columns present in the database tables defined above are contained herein.

Column Name	Table Name	Description
ActionID	EcSbActionWorkoff	A unique index ID generated automatically by Sybase to identify a row in the database table.
ActionStatus	EcSbActionWorkoff	A status of the action processing, either NULLs or Failed.
Actual	EcSbTriggerRequest	The actual qualifier list of a triggered event as a GlParameterList in string representation.
Category	EcSbEvent	The ranking of an event.
EcDbComments	EcDbDatabaseVersions	Notes or comments on the database version level.
EcDbCurrentVersionFlag	EcDbDatabaseVersions	Flag indicating if this row represents the current database version entry. Valid Values: 1= yes, 0 = no
EcDbDatabaseName	EcDbDatabaseVersions	The name of the database for which this database version level is applied.
EcDbDropDescription	EcDbDatabaseVersions	The official description of the ECS software drop for this database version level.
EcDbDropInstallDate	EcDbDatabaseVersions	The date and time that the database version level was installed.
EcDbDropVersion	EcDbDatabaseVersions	The official name of the ECS software drop for this database version level.
EcDbSchemaVersionId	EcDbDatabaseVersions	The subsystem-specific identifier for this database schema version.
EcDbSybaseServer	EcDbDatabaseVersions	Description: The name of the baseline Sybase SQL server controlling this database. Valid Values: See 920-TDx-009
EcDbSybaseVersion	EcDbDatabaseVersions	Description: The software release version of the Sybase SQL server in place when this database version level was initially installed.
EcDbUpdateProcess	EcDbDatabaseVersions	Description: The installation method by which this database version level was installed.
EventID	EcSbEvent	Unique identifier of the event.
eventID	EcSbSubscription	Unique identifier of the event.
EventID	EcSbTriggerRequest	Unique identifier of the event.
EventStatus	EcSbTriggerRequest	A status of the event processing, either NULL or Failed.

Column Name	Table Name	Description
expDate	EcSbSubscription	Date that the subscriptions expire. Default is today. Must be >= today.
ID	EcSbNewSubID	The identification number available for the next subscription generated.
ID	EcSbNewEventID	The identification number available for the next event generated.
Object	EcSbEvent	Event information including qualifiable metadata.
object	EcSbSubscription	Subscription information including the qualifier a user specifies.
OutBoundRpcID	EcSbActionWorkoff	Description: A unique ID used to identify a request to an action provider in the processing of a subscription.
RpcID	EcSbSubActionWorkoff	A unique ID used for each call issued from event producer to identify a trigger request.
RpcID	EcSbTriggerRequest	A unique ID used for each call issued from event producer to identify a trigger request.
RpcID	EcSbSubWorkoff	A unique ID used for each call issued from event producer to identify a trigger request.
SubID	EcSbActionWorkOff	Unique identifier of the subscription.
subID	EcSbSubscription	Unique identifier of the subscription.
SubID	EcSbSubWorkOff	Unique identifier of the subscription.
TimeReceived	EcSbTriggerRequest	The time that the trigger request was received from event producer.
TimeReceived	EcSbSubWorkoff	The time that the trigger request was received from event producer.
TimeReceived	EcSbActionWorkOff	The time that the trigger request was received from event producer.
Tries	EcSbActionWorkoff	A count of times that a subscription's action has failed in processing.
UserID	EcSbEvent	User registering the Event.
userID	EcSbSubscription	User registering the Subscription.

3.1.4 Column Domains

Domains specify the ranges of values allowed for a given table column. Sybase supports the definition of specific domains to further limit the format of data for a given column. Sybase domains are, in effect, user-defined data types. There are no domains defined in the SUBSRV database.

3.1.5 Rules

Sybase supports the definitions of rules. Rules provide a means for enforcing domain constraints on a given column. There are no rules defined in Sybase for the SUBSRV database.

3.1.6 Defaults

Defaults are used to supply a value for a column when one is not defined at insert time. There are no defaults defined in Sybase in the SUBSRV database.

3.1.7 Views

Sybase allows the definition of views as a means of limiting an application or users access to data in a table or tables. Views create a logical table from columns found in one or more tables. There are no views defined in the SUBSRV database.

3.1.8 Integrity Constraints

Sybase allows the enforcement of referential integrity via the use of declarative integrity constraints. Integrity constraints allow the SQL server to enforce primary and foreign key integrity checks without automatically without requiring programming. Constraints support "restrict-only" operations. This means that a row cannot be deleted or updated if there are rows in other tables having a foreign key dependency on that row. Cascade delete and update operations cannot be performed if a declarative constraint has been used. There are no declarative integrity constraints defined in the SUBSRV database.

3.1.9 Triggers

Sybase supports the enforcement of business policy via the use of triggers. A trigger is best defined as set of activities or checks that should be performed automatically whenever a row is inserted, updated, or deleted from a given table. Sybase allows the definition of insert, update, and delete trigger per table.

Name	Description
TrigInsertTriggerRequest	Builds EcSbSubWorkOff table and updates time field in EcSbTriggerRequest when EcSbTriggerRequest is inserted a new data record

3.1.10 Stored Procedures

Sybase also includes support for business policy via the use of stored procedures. Stored procedures are typically used to capture a set of activities or checks that will be performed on the database repeatedly to enforce business policy and maintain data integrity. Stored procedures are parsed and compiled SQL code that reside in the database and may be called by name by an application, trigger or another stored procedure. A listing of each of the stored procedures in the SUBSRV database is given in Table 3-10. A brief definition of each of these stored procedures follows.

Table 3-10. Stored Procedure Listing

Name	Description
EcCsProcNumObjects	Verifies the correct number of objects in the database.
ProcCheckActiveRequest	Checks active rows in EcSbActionWorkOff that have Tries <= MaxTries
ProcCheckRpcID	Returns a 0 if data record does not exist, otherwise returns a 1.
ProcDeleteActionWorkOff	Deletes the most recent RPCId and SubId from the EcSbActionWorkOff table.
ProcDeleteActionWorkOffEntry	Deletes data record whose requestID and subID = given values.
ProcDeleteExpiredRequests	Deletes data records from EcSbTriggerRequest exceeds MaxTimePeriod
ProcDeleteSubWorkOff	Deletes the most recent RPCId and SubId from the EcSbSubWorkOff table.
ProcDeleteSubWorkOffEntry	Deletes specified data records from EcSbActionWorkOff.
ProcGetActual	Retrieves the actual field from the TriggerRequest table.
ProcGetActualAndSubInAction	Retrieves time-ordered data records from the EcSbActionWorkOff table. It also retrieves data fields from EcSbTriggerRequest and EcSbSubscription. It replaced ProcGetActionWorkOffList.
ProcGetActualAndSubInSub	Retrieves time-ordered data records from the EcSbSubWorkOff table. It also retrieves data fields from EcSbTriggerRequest and EcSbSubscription. It replaced ProcGetSubWorkOffList.
ProcGetAllEvents	Retrieves all registered events.
ProcGetAllSubs	Retrieves all existing subscriptions.
ProcGetCatEvents	Retrieves all events for a given category.
ProcGetEvent	Retrieves a specific event.
ProcGetEventID	Returns the next available event ID.
ProcGetEventIDSubs	Selects subscriptions made against a specific event.
ProcGetExpSubs	Retrieves events scheduled to expire on a specific date.
ProcGetFailedActionList	Retrieves time-ordered failed data fields.
ProcGetSub	Retrieves a specific subscription.
ProcGetSubID	Returns the next available subscription ID.
ProcGetUIDEvents	Retrieves events for a specific user.
ProcGetUserIDSubs	Retrieves subscriptions for a specific user.
ProcInsertAction	Inserts data records and sets initial data values.
ProcRemoveEvent	Deletes a specific event.
ProcRemoveSub	Deletes a specific subscription.
ProcUpdateActionWorkOff	Updates the data Tries
datawarning	System Procedures
logdump	System Procedures
logwarning	System Procedures

3.2 Flat File Usage

There are cases when the implementation of a persistent data requirement is better suited to a flat file than to a database table. A typical example of such data is system configuration information.

System configuration information is fairly static and usually has no explicit relationship to other data in the enterprise. Another common use of files in ECS is as an interface mechanism between ECS and the external world. There are no flat files used in SUBSRV.

3.2.1 Files Definitions

Not applicable.

3.2.2 Attributes

Not applicable.

3.2.3 Attribute Domains

Not applicable.

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4. Performance and Tuning Factors

4.1 Indexes

An index provides a means of locating a row in a database table based on the value of a specific column(s), without having to scan all data in the table. When properly implemented, indexes can significantly decrease the time it takes to retrieve data, thereby increasing performance. Sybase allows the definition of two types of indexes, clustered and non-clustered.

In a clustered index, the rows in a database table are physically stored in sequence-determined by the index. Clustered indexes are particularly useful, when the data is frequently retrieved in sequential order. Only one clustered index may be defined per table.

Non-clustered indexes differ from their clustered counterpart, in that, data is not physically stored in sorted order—newly added rows are stored at the end of the related database table.

A key of the types of indexes found in SUBSRV is provided in Table 4-1 Index Type Key. A description of each of the defined indexes is given in Table 4-2 Index List.

Table 4-1. Index Type Key

Index Type Key	Description
PK	Primary Key
FK	Foreign Key
U	Unique – Only one for the column code combination
C	Clustered or non-clustered index
Sort	ASC (ascending) of DESC (descending) order

Table 4-2. Index Listing (1 of 2)

Table Code	Index Code	Primary Key	Foreign Key	Unique	Clustered
EcSbEvent	IndexEventID IndexUID IndexCategory	No No No	No No No	Yes No No	No Yes No
EcSbNewEventID	Objects have no index				
EcSbNewSubID	Objects have no index				

Table 4-2. Index Listing (2 of 2)

Table Code	Index Code	Primary Key	Foreign Key	Unique	Clustered
EcDbDatabaseVersions	PK_ECDBVERSIONS	Yes	No	Yes	Yes
EcSbActionWorkOff	ActionIDIndex	No	No	Yes	No
EcSbActionWorkOff	ReqIDSubIDIndex	No	No	Yes	No
EcSbSubWorkOff	RpcIDIndex	No	No	Yes	No
EcSbSubWorkOff	TimeRpcSubIndex	No	No	Yes	Yes
EcSbSubscription	EcSbSubscr_8000058811	Yes	No	Yes	Yes
EcSbSubscription	eventIDIndex	No	No	No	No
EcSbSubscription	expDateIndex	No	No	No	No
EcSbSubscription	userIDIndex	No	No	No	No
EcSbTriggerRequest	RpcIDIndex	No	No	Yes	No

4.2 Segments

Sybase supports the declaration of segments. A segment is a named pointer to a storage device(s). Segments are used to physically allocate a database object to a particular storage device. Segments defined for the SUBSRV and all other subsystem databases are described in Table 4-3.

Table 4-3. Segment Descriptions

Segment Name	Description
default	Default data segment used if no other segment specified in the create statement.
logsegment	SYSLOGS, Transaction Logs.
systemsegment	System tables and indexes.

4.3 Caches

A cache is a block of memory that is used by Sybase to retain and manage pages that are currently being processed. By default, each database contains three caches:

- Data cache – retains most recently accessed data and index pages
- Procedure cache – retains most recently accessed stored procedure pages
- User transaction log cache – transaction log pages that have not yet been written to disk for each user

The size of each of these default caches is a configurable item, which must be managed on a per DAAC basis. These caches may be increased or decreased by the DAAC DBA as needed.

The data cache can be further subdivided into named caches. A *named cache* is a block of memory that is named and used by the DBMS to store data pages for select tables and/or indexes. Assigning a database table to named cache causes accessed pages to be loaded into memory and retained. The named cache does not need to be allocated to accommodate the entire database table since the DBMS manages the cache according to use. Named caches greatly increase performance by eliminating the time associated for disk input and output (I/O). There are no named caches that are currently defined for the SUBSRV Subsystem database. Named caches may be defined as the memory usage of the SUBSRV database becomes better known and the DAACs move into an operational environment. As named caches are defined this portion of the document will be updated.

There are no named caches for the subscription server database.

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5. Database Security

5.1 Approach

The database security discussed within this section is bounded to security implementation within the Sybase SQL Server DBMS. A Sybase general approach to security is adopted as illustrated in Figure 5-1.

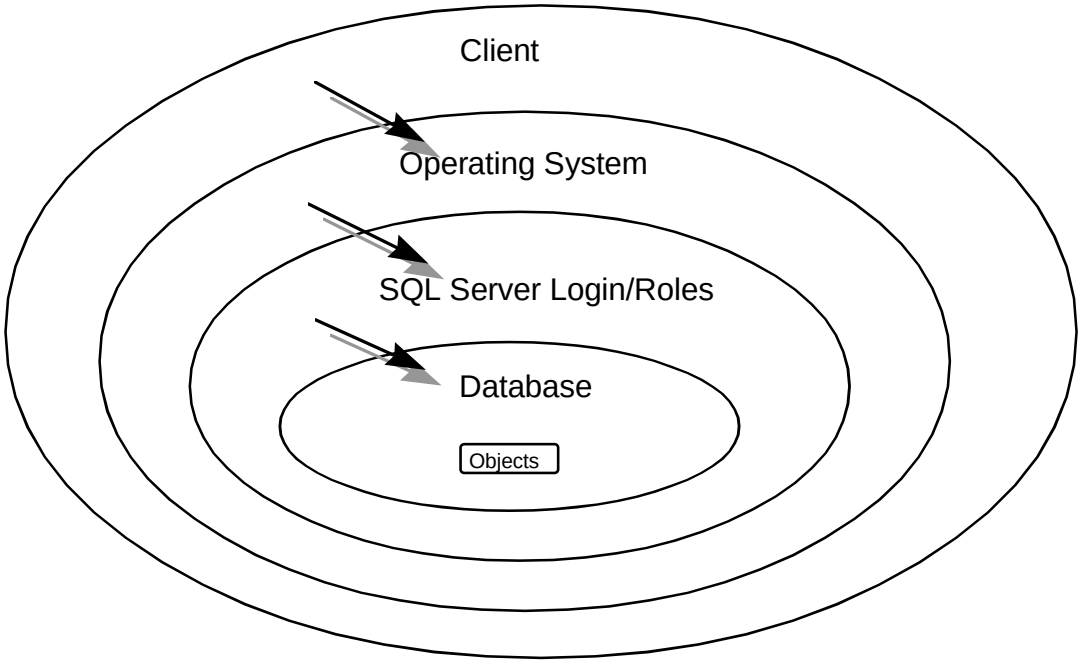

Figure 5-1. Sybase General Approach to SQL Server Security[1]

5.2 Users

The client (user) requires a SQL Server login to access the DBMS. The login is assigned to a user with certain related permissions for gaining access to particular objects (e.g., database tables, views, commands) within the database. The System Administrator may grant or revoke objects permissions for a login individually or based on defined group or roles.

[1] Reference Sybase Student Guide: *Advanced SQL Server A<SUBSYS>inistration*.

5.3 Groups

Groups are a means of logically associating users with similar data access needs. Once a group has been defined, object and command permissions can be granted to that group. A user who is member of a group inherits all of the permissions granted to that group. No groups have been initially defined in the SUBSRV Subsystem “default database. The DAACs should define database groups to support the database security requirements of their individual DAACs. Security for local DAAC users should be controlled by assigning each user to the appropriate group.

5.4 Roles

Roles were introduced in Sybase to allow a structured means for granting users the permissions needed to perform standard database administration activities and also provide a means for easily identifying such users. There are six pre-defined roles that may be assigned to a user. A definition of each of these roles follows, as well as a description of the types of activities that may be performed by each role.

System Administrator (*sa_role*): This role is used to grant a specific user permissions needed to perform standard system administrator duties including:

- installing SQL server and specific SQL server modules
- managing the allocation of physical storage
- tuning configuration parameters
- creating databases

Site Security Officer (*sso_role*): This role is used to grant a specific user the permissions needed to maintain SQL server security including:

- adding server logins
- administrating passwords
- managing the audit system
- granting users all roles except the *sa_role*

Operator (*oper_role*): This role is used to grant a specific user the permissions needed to perform standard functions for the database including:

- dumping transactions and databases
- loading transactions and databases

Navigator (*navigator_role*): This role is used to grant a specific user the permissions needed to manage the navigation server.

Replication (*replication_role*): This role is used to grant a specific user the permissions needed to manage the replication server.

Sybase Technical Support (*sybase_ts_role*): This role is used to grant a specific user the permissions needed to execute *database consistency checker (dbcc)*, a Sybase supplied utility supporting commands that are normally outside of the realm of routine system administrator activities.

The DAACs should review these roles and assign them to the appropriate login and/or groups.

5.5 Login/Group Object Permissions

During initial database installation logins used by the ECS custom code were created and permissions assigned for access to the SUBSRV Subsystem database. In addition, special database installation login, subsrv_role, was created to support database installation needs. For each login, the level of access is limited to that associated with their login, group or assigned group/role. Object Permissions are set within the installation scripts of the SUBSRV Subsystem for each object and group/role.

Permissions are identified in Table 5-1. A specification of the object permissions is contained in Table 5-2.

Table 5-1. Permission Key

Permission	Description
A	All
S	Select
I	Insert
U	Update
D	Delete
E	Execute

Table 5-2. Object Permissions (1 of 3)

Group/User	Sybase Login	Object	Grant				
			Select	Insert	Update	Delete	Execute
public		ProcGetAllEvents					G
public		ProcGetAllSubs					G
public		ProcGetCatEvents					G
public		ProcGetEvent					G
public		ProcGetEventID					G
public		ProcGetEventIDSubs					G
public		ProcGetExpSubs					G
public		ProcGetSub					G
public		ProcGetSubID					G
public		ProcGetUIDEvents					G
public		ProcGetUserIDSubs					G

Table 5-2. Object Permissions (2 of 3)

Group/User	Sybase Login	Object	Grant				
			Select	Insert	Update	Delete	Execute
public		ProcRemoveEvent					G
public		ProcRemoveSub					G
		Table:					
public		EcSbEvent	G	G	G	G	
public		EcSbNewEventID	G	G	G	G	
public		EcSbNewSubID	G	G	G	G	
public		EcSbSubscription	G	G	G	G	
sbsrv	EcSbSubServer	EcDbDatabaseVersions	G	G	G	G	
sbsrv	EcSbSubServer	EcSbActionWorkOff	G	G	G	G	
sbsrv	EcSbSubServer	EcSbEvent	G	G	G	G	
sbsrv	EcSbSubServer	EcSbNewEventID	G	G	G	G	
sbsrv	EcSbSubServer	EcSbNewSubID	G	G	G	G	
sbsrv	EcSbSubServer	EcSbSubWorkOff	G	G	G	G	
sbsrv	EcSbSubServer	EcSbSubscription	G	G	G	G	
sbsrv	EcSbSubServer	EcSbTriggerRequest	G	G	G	G	
		Stored Procedures:					
sbsrv	EcSbSubServer	EcCsProcNumObjects					G
sbsrv	EcSbSubServer	ProcCheckActiveRequests					G
sbsrv	EcSbSubServer	ProcCheckRpcID					G
sbsrv	EcSbSubServer	ProcDeleteActionWorkOff					G
sbsrv	EcSbSubServer	ProcDeleteActionWorkOffEntry					G
sbsrv	EcSbSubServer	ProcDeleteExpiredRequests					G
sbsrv	EcSbSubServer	ProcDeleteSubWorkOff					G
sbsrv	EcSbSubServer	ProcDeleteSubWorkOffEntry					G
sbsrv	EcSbSubServer	ProcGetActual					G
sbsrv	EcSbSubServer	ProcGetActualAndSubInAction					G
sbsrv	EcSbSubServer	ProcGetActualAndSubInSub					G
sbsrv	EcSbSubServer	ProcGetAllEvents					G
sbsrv	EcSbSubServer	ProcGetAllSubs					G
sbsrv	EcSbSubServer	ProcGetCatEvents					G
sbsrv	EcSbSubServer	ProcGetEvent					G
sbsrv	EcSbSubServer	ProcGetEventID					G
sbsrv	EcSbSubServer	ProcGetEventIDSubs					G
sbsrv	EcSbSubServer	ProcGetExpSubs					G
sbsrv	EcSbSubServer	ProcGetFailedActionList					G
sbsrv	EcSbSubServer	ProcGetSub					G
sbsrv	EcSbSubServer	ProcGetSubID					G

Table 5-2. Object Permissions (3 of 3)

Group/User	Sybase Login	Object	Grant				
			Select	Insert	Update	Delete	Execute
sbsrv	EcSbSubServer	ProcGetUIDEvents					G
sbsrv	EcSbSubServer	ProcGetUserIDSubs					G
sbsrv	EcSbSubServer	ProcInsertAction					G
sbsrv	EcSbSubServer	ProcRemoveEvent					G
sbsrv	EcSbSubServer	ProcRemoveSub					G
sbsrv	EcSbSubServer	ProcUpdateActionWorkOff					G
sbsrv	EcSbSubServer	datawarning					G
sbsrv	EcSbSubServer	logdump					G
sbsrv	EcSbSubServer	logwarning					G
sa_role	subsrv_role	all					

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6. Scripts

6.1 Installation Scripts

Any scripts used to support installation of the SUBSRV database are described in Table 6-1. These files are found in the directory /ecs/formal/CSS/DOF/src/SUBSCRIPTION/sybase.

Table 6-1. Installation Scripts

Script File	Description
EcCsSbDbBuild	Installs/populates Subscription Server database

6.2 De-Installation Scripts

Any scripts used to support de-installation of the SUBSRV database are described in Table 6-2.

Table 6-2. De-Installation Scripts

Script File	Description
EcCsSbDbDrop	Drops database objects

6.3 Backup/Recovery Scripts

Any scripts used to facilitate backup or recovery of the SUBSRV database are described in Table 6-3.

Table 6-3. Backup and Recovery Scripts

Script File	Description
EcCsSbDbDump	Creates a backup of the database
EcCsSbDbLoad	Restores the database

6.4 Miscellaneous Scripts

Miscellaneous scripts applicable to the SUBSRV database are described in Table 6-4.

Table 6-4. Miscellaneous Scripts

Script File	Description
EcCsSbDbPatch	Install database schema modifications

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Appendix A. Subscription Server Subsystem Entity Relationship Diagrams

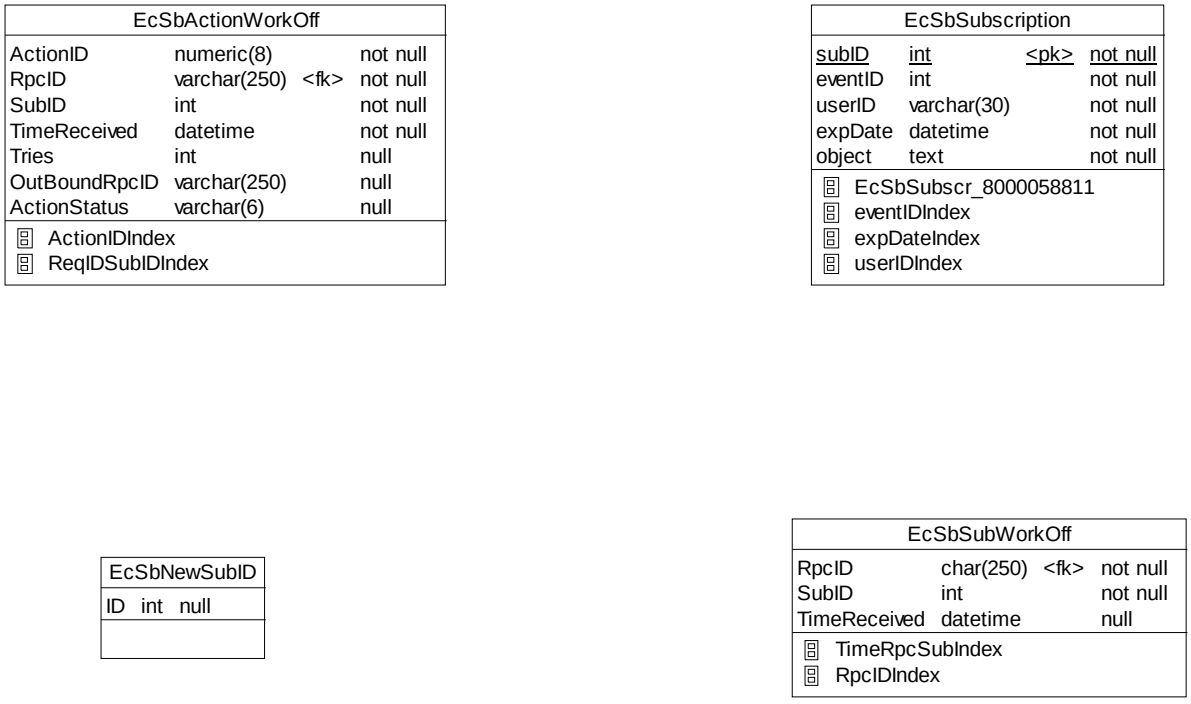

Figure A-1. Subscription Information

EcSbNewEventID			
ID	int		null

EcSbEvent			
EventID	int	<pk>	not null
UserID	varchar(14)		not null
Category	varchar(35)		not null
Object	text		not null
IndexEventID			
IndexUID			
IndexCategory			

EcSbTriggerRequest			
RpcID	varchar(250)	<pk>	not null
EventID	int	<fk>	null
Actual	text		not null
TimeReceived	datetime		null
EventStatus	varchar(6)		null
RpcIDIndex			

Figure A-2. Event Information

EcDbDatabaseVersions			
EcDbSchemaVersionId	smallint	<pk>	not null
EcDbDropVersion	char(64)	<pk>	not null
EcDbDropDescription	varchar(255)		null
EcDbCurrentVersionFlag	char(1)		null
EcDbDatabaseName	varchar(255)		null
EcDbDropInstallDate	datetime		null
EcDbSybaseVersion	varchar(255)		null
EcDbSybaseServer	varchar(255)		null
EcDbComments	varchar(255)		null
EcDbUpdateProcess	varchar(255)		null
PK_ECDBVERSIONS			

Figure A-3. Database Version Information

Abbreviations and Acronyms

ANSI	American National Standards Institute
ASCII	American Standard Code for Information Exchange
CASE	Computer Aided Software Engineering
CD	contractual delivery
CDRL	contract data requirements list
CI	configuration item
COTS	commercial off-the-shelf (hardware or software)
CSCI	computer software configuration item
DAAC	Distributed Active Archive Center
DBCC	Database Consistency Checker
DBMS	Database Management System
DCN	Document Change Notice
DID	data item description
DMS	Data Management Subsystem
ECS	EOSDIS Core System
EDC	EROS Data Center
EDHS	ECS Data Handling System
EOSDIS	Earth Observing System Data and Information System
EROS	Earth Resources Observation System
ERD	Entity Relationship Diagram
ESDIS	Earth Science Data and Information System (GSFC)
ESDT	Earth science data types
ESN	EOSDIS Science Network (ECS)
FK	Foreign Key
GSFC	Goddard Space Flight Center
GUI	graphic user interface
HDF	hierarchical data format

HDF-EOS	an EOS proposed standard for a specialized HDF data format
HTML	HyperText Markup Language
HTTP	Hypertext Transport Protocol
I/O	input/output
ICD	interface control document
INGST	Ingest Services CSCI
IOS	Interoperability Subsystem
LaRC	Langley Research Center (DAAC)
MSS	Management Support Subsystem
N/A	not applicable
NAS	National Academy of Science
NASA	National Aeronautics and Space Administration
NSIDC	National Snow and Ice Data Center (DAAC)
ODL	Object Definition Language
PCF	Process Control File
PDF	Portable Document Format
PDPS	Planning and Data Processing Subsystem
PGE	Product Generation Executive
PK	Primary Key
QA	Quality Assurance
SDSRV	Science Data Server CSCI
SQL	Structured Query Language
STMGT	Storage Management Software CSCI
SUBSRV	Subscription Server
WWW	World-Wide Web